PART II. ECONOMIC INCENTIVES

Economic as well as educational factors can influence tobacco consumption by increasing the costs of manufacturing, distributing, selling, or consuming cigarettes. Direct increases in consumer costs affect consumption patterns directly, but cost increases to suppliers ultimately affect consumers too, to the extent that supplier costs are passed on to consumers. This Section considers two economic instruments, taxation and insurance, and discusses how public and private policies have created economic disincentives for tobacco use.

The simplest economic disincentive to consumption is to raise the price of a product. Governments have done so by imposing a tax on tobacco, usually an excise tax, which offers the benefit of generating public revenue. Insurers' policies work more indirectly to discourage smoking. Premium differentials make insurance more expensive for smokers to purchase; this effectively increases the cost of being a smoker, although its impact is not felt directly at the point of cigarette purchase. Health insurers' decisions about the reimbursability of smoking cessation treatment costs also create economic incentives. For the smoker, reimbursement removes a financial impediment to cessation; for the provider, reimbursement presumably would stimulate the availability of cessation services. Unlike taxation, insurance mechanisms are largely private policies; however, they can be encouraged and supported by government actions. In addition, government acts as a health insurer through publicly funded programs, such as medicare, and theoretically could use insurance mechanisms to promote nonsmoking. It is important to note that taxation and insurance incentives may influence smoking behavior through more than purely economic mechanisms; they also remind smokers that smoking is a harmful and socially discouraged behavior.

Other policies that act via economic mechanisms are not discussed. Chief among these is the Federal policy of tobacco price supports and the allotment system. As an agricultural policy not oriented toward tobacco consumption (although it may have an indirect impact) (Warner 1988; Johnson 1984), it is not within the scope of this Chapter. Also not discussed in this Chapter is a current high-visibility antitobacco activity with potentially important economic effects relevant to consumption: the ongoing efforts to establish the legal liability of tobacco manufacturers for the diseases caused by their products (Daynard 1988). Although product liability suits themselves are not policies, policymaking pertaining to them could influence the number and ultimate impact of these suits. For example, recent legislative action in California attempts to limit the legal liability of tobacco manufacturers and vendors for claims brought in that State. California's Civil Liability Reform Act of 1987 (California Chapter 1498) includes a section specifically exempting manufacturers or sellers of tobacco products from product liability actions.

Economic incentives are not limited to public and private policies. Smoking cessation programs have used economic incentives to encourage participation or success, and employers have offered employees economic incentives not to smoke. These nonpolicy uses of incentives are identified in Chapter 6 and are discussed elsewhere (Warner and Murt 1984).

Tobacco Excise Taxation

Excise taxes are sales taxes on specific commodities such as tobacco products. Although accounting for only a small percentage of aggregate tax receipts in the United States today, excise taxes provide revenue for Federal, State, and local governments. The primary fiscal attraction of excise taxes is their low administrative cost relative to the revenue they can generate. In theory, to generate substantial revenue, excise taxes should be placed on commodities with a broad base of consumption that is not substantially reduced by the imposition of the tax. Hence, during the Middle Ages, the salt tax was an important source of revenue. In the United States, tobacco, alcohol, and gasoline have emerged as commodities subject to special excise taxes.

In addition to being an attractive source of revenue, excise taxes on tobacco have a history as measures designed to reflect public morality by taxing "sinful" behaviors. More recently, as attention has focused on the deleterious health effects of cigarette smoking, it has been recognized that excise taxes have the potential to enhance public health by reducing the consumption of tobacco. The capacity to simultaneously raise revenue and enhance public health has made the tobacco excise tax a particularly attractive public policy tool (Lewit 1985; Warner et al. 1986b).

This Section reviews the history and current status of cigarette excise taxation at the Federal, State, and local levels, focusing on the period since 1964. It examines the relationship between changes in taxes on cigarettes and changes in cigarette consumption, with particular attention to the consequences of the doubling of the Federal excise tax in 1983, and it identifies tax-related policies under serious consideration.

History and Current Status

Federal Excise Taxes

Tobacco was one of the first goods to be taxed in North America, first by the British and then by the newly independent Republic in the early 1790s (Tobacco Institute 1988). The early tax on snuff was eliminated in 1804 and revived briefly as a wartime measure in 1814. A number of Federal tobacco taxes, including a tax on cigarettes, were imposed in 1864 as part of a package of taxes to finance the Civil War. Federal excise taxes on tobacco in one form or another have remained a part of the Federal tax system since that time. The tax on tobacco was a particularly important source of revenue to the Federal Government prior to the enactment of the income tax in 1913.

Generally, the Federal tax on cigarettes over the 120-year period from 1864–1983 tended to fluctuate with the revenue requirements of the Government, corresponding to alternating periods of war and peace. The Federal tax on cigarettes, introduced during the Civil War, was raised briefly during the Spanish American War, and again during World Wars I and II. In November 1951, during the Korean War, the Federal excise tax was increased from 7 to 8 cents per pack. It remained at this level for over three decades, until March 1, 1983, when it was temporarily doubled to 16 cents per pack as part of the Tax Equity and Fiscal Responsibility Act of 1982. After several temporary extensions, Congress made the 16-cent rate permanent in 1986. A Federal excise tax on smokeless tobacco was levied by the Omnibus Budget Reconciliation Act of 1985, which imposed taxes of 24 cents per lb on snuff and 8 cents per lb on chewing tobacco. This is equivalent to a 1.8-cent tax on a 1.2-oz can of snuff and a 1.0-cent tax on a 2-oz pouch of chewing tobacco.

In the year ending June 30, 1987, Federal tobacco taxes grossed 4.8 billion dollars. Over 98 percent of Federal tobacco tax revenues were provided by the tax on cigarettes (Tobacco Institute 1988). Cigarette excise taxes have provided a declining share of total Federal revenue during the post-World War II period. Accounting for over 3 percent of Federal revenues in 1950, the share of total Federal revenues attributable to cigarette excise taxes fell from 1.76 percent in 1964 to 0.52 percent in 1987 (see Figure 3). This occurred despite a doubling of the tax in nominal terms in 1983 and an increase in total tax receipts of over 2.8 billion dollars between fiscal 1964 and fiscal 1987.

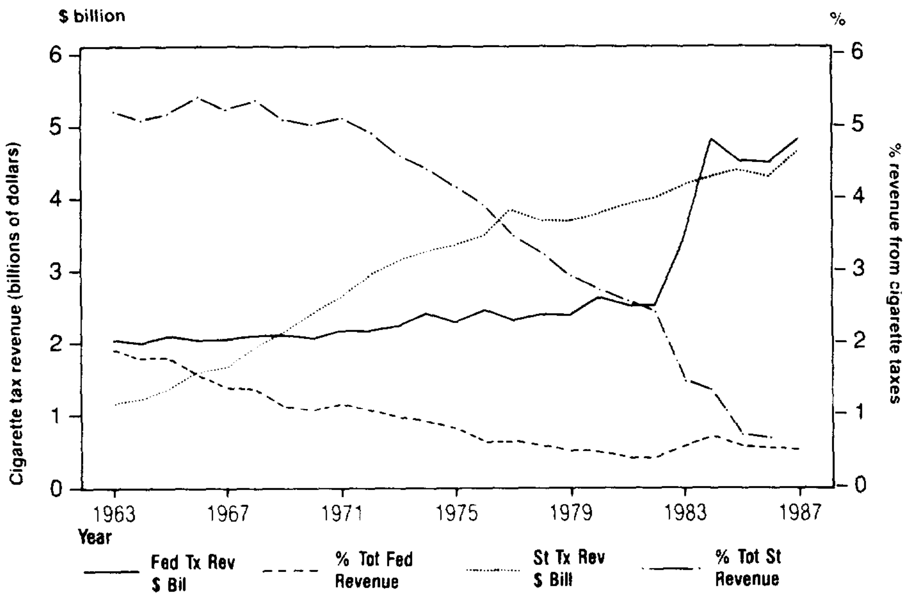

FIGURE 3.—Gross revenue and percentage of total revenue from cigarette tax, State and Federal Governments, 1963–87

NOTE: Figures in current dollars.
SOURCE: Tobacco Institute (1988b). Calculations by OSH.

The Federal excise tax has declined in real terms since 1964, despite the rising concern about the adverse effects of smoking on health that followed the release of the 1964 Surgeon General's Report and the adoption of specific Federal tobacco control policies. One reason for the decline was the lack of legislated increases in the tax rate. Only the prospect of huge Federal budget deficits that accompanied the 1981 tax cuts prompted renewed interest in the cigarette excise tax as a source of funds to help reduce the projected deficits (Toder 1985). Inflation also eroded the real excise tax rate because the excise taxes on cigarettes are unit rather than ad valorem taxes. A unit tax is a constant nominal rate per unit of a well-defined product, whereas the ad valorem tax is a constant fraction of either wholesale or retail price. Current Federal taxes on cigarettes, cigarette papers and tubes, smokeless and smoking tobacco, and small cigars, as well as most State and local taxes on cigarettes, are unit taxes. Federal taxes on large cigars and most State taxes on noncigarette tobacco products are ad valorem taxes.

Cigarette taxes fall relative to the price of cigarettes when cigarette taxes are not changed by at least as much as the rate of general inflation or the rate of increase in cigarette prices. The Federal tax has increased only once since 1951. Accordingly, the real tax (in 1987 value) fell from 30.4 to 9.8 cents per pack of 20 cigarettes between 1964 and 1982. The doubling of the nominal tax from 8 to 16 cents per pack in 1983 caused the tax to nearly double in real terms, to 19 cents (1987 value), between 1982 and 1983. However, inflation since 1983 has gradually eroded the tax to less than 16 cents (1987 value) today. During this same period, the Federal tax as a percentage of average retail price (including taxes) declined from 30.3 to 10.7 percent between 1964 and 1982, increased to 17.8 percent in 1983, and declined again to 13.7 percent in 1987 (Figure 4).

State and Local Excise Taxes

All States, the District of Columbia, and nearly 400 localities currently impose excise taxes on cigarettes in addition to the Federal tax. In 1921, Iowa became the first State to tax cigarettes. By 1964, 49 States had enacted cigarette taxes. The last State to enact an excise tax on cigarettes, North Carolina, did so in 1969. Since then, a number of States have modified their cigarette taxes, as described below. As of June 30, 1988, State excise tax rates ranged from a low of 2 cents per pack in North Carolina to a high of 38 cents in Minnesota. The average State tax was 18.2 cents per pack. In the year ending June 30, 1987, State tobacco taxes generated revenues of 4.8 billion dollars; almost 98 percent was provided by State cigarette taxes. In addition, 40 States and the District of Columbia imposed general sales taxes on cigarettes in 1987. In 35 States, the sales tax value base included the State excise tax. As a result, sales taxes added up to 10 cents per pack to the price of cigarettes in the highest tax States (Connecticut and Washington) in 1987. States have also increased their taxation of smokeless tobacco. In 1964, only 14 States taxed smokeless tobacco. By 1987, this number had nearly doubled to 27 (Tobacco Institute 1988).

During the local fiscal crises that resulted from the Depression of the 1930s, municipal governments also began to enact tobacco taxes. The spread of cigarette taxes has not been as rapid or extensive among municipal governments as it was among State

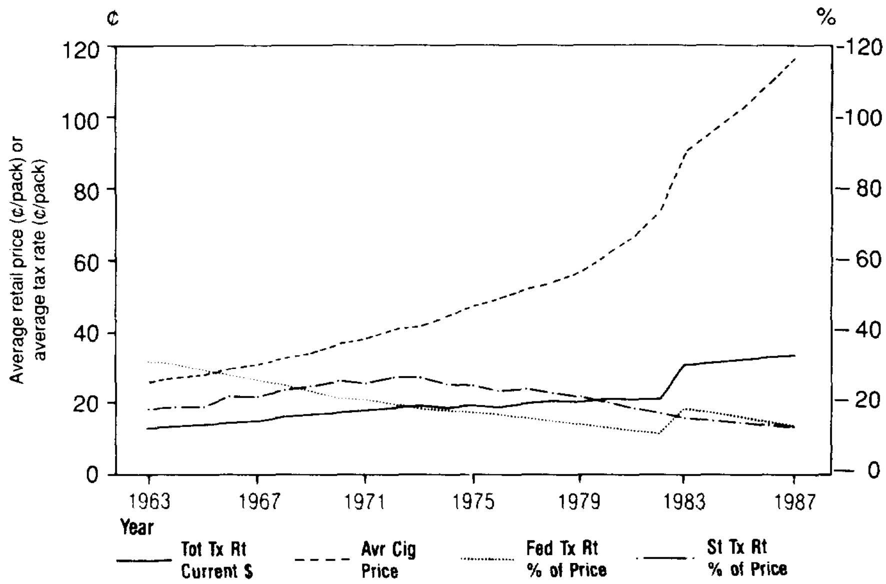

FIGURE 4.—Federal and State cigarette excise tax rates and retail cigarette prices, 1963–87

SOURCE: Tobacco Institute (1988). Calculations by OSH.

governments. As of 1987, 369 cities and 20 counties in 6 States imposed local taxes on tobacco products. Taxes are levied by communities in Alabama, Illinois, Missouri, New York, Tennessee, and Virginia. In the year ending June 30, 1987, these taxes ranged from 1 to 15 cents per pack and yielded revenues of 197 million dollars. Over 70 percent of local cigarette tax revenues are collected in New York City and Chicago–Cook County, IL, where the local tax rates are 8 and 23 cents per pack, respectively.

During the period following the 1964 Surgeon General's Report, State cigarette excise tax receipts grew much more rapidly than Federal receipts (Figure 3), but their share of total State tax revenue declined. State tax receipts averaged a fairly constant 5 percent of total State revenues during the initial part of the period, but the proportion has declined steadily since 1972. Gross receipts from local taxes on cigarettes have grown from 58 million dollars in 1964 to 197 million dollars in 1987, less than the growth rate of State tax receipts but more rapid than Federal tax receipt change in the same period. The number of local jurisdictions taxing cigarettes has not increased appreciably (Tobacco Institute 1988).

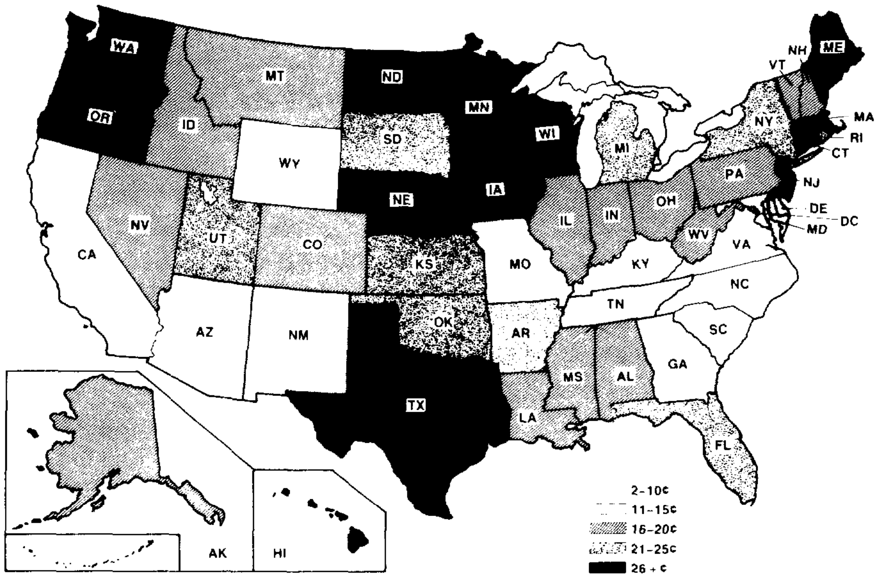

FIGURE 5.—State cigarette excise tax rates (as of June 30, 1988)
SOURCE: Tobacco Institute (1988a).

Between 1963 and 1987, the average State tax on cigarettes in current dollars increased almost annually, but because the rate of increase slowed relative to the rate of inflation after 1972, the real tax rate and the tax rate as a percentage of retail price have each declined by over 40 percent in the past 15 years. The rate of increase in State taxes accelerated after 1980, so that on average, it has kept pace with the general rate of inflation since that time (Figure 4).

Considerable differences in cigarette tax rates among States have persisted over the last 25 years (Figure 5). Not until 1969 did all States tax cigarettes. At that time, the maximum State tax rate was 16 cents, and the difference between the tax rate in the highest and lowest tax States was 14 cents (Table 11). The range of State cigarette taxes in constant dollars was greatest in 1971 and fell steadily through 1981. This decline occurred because the lowest tax State maintained a constant nominal tax rate and taxes in the high-tax States failed to keep pace with inflation. Since 1982, tax increases in high-tax States have tended to keep pace with the rate of inflation. The major tobacco-producing States of North Carolina, Kentucky, and Virginia have maintained low cigarette tax rates since 1964. The largest tax increases have occurred in Oregon, which did not even tax cigarettes in 1964, in Minnesota, and in California in November 1988.

Differences in cigarette tax rates among States and local jurisdictions can create problems with the enforcement of State and local tax laws and can result in lost revenues to some jurisdictions. In particular, large differences in cigarette tax rates among and within States provide an incentive for bootlegging; that is, purchasing of cigarettes in low-tax jurisdictions for consumption or resale in high-tax jurisdictions. A variety of tax evasion activities have been identified: casual smuggling (individuals buying

TABLE 11.—Dispersion in cigarette excise tax rates among States, 1963–87

Year	Number of taxing States[a]	Minimum tax, current dollars (cents/pack)	Maximum tax, current dollars (cents/pack)	Minimum tax, 1987 dollars (cents/pack)	Maximum tax, 1987 dollars (cents/pack)	Range, 1987 dollars (cents/pack)
1963	48	0.0	8.0	0.0	29.6	29.6
1964	49	0.0	8.0	0.0	29.3	29.3
1965	49	0.0	11.0	0.0	39.6	39.6
1966	50	0.0	11.0	0.0	38.5	38.5
1967	50	0.0	13.0	0.0	44.2	44.2
1968	51	0.0	15.0	0.0	49.0	49.0
1969	51	2.0	16.0	6.2	49.5	43.3
1970	51	2.0	18.0	5.8	52.6	46.8
1971	51	2.0	21.0	5.6	58.9	53.3
1972	51	2.0	21.0	5.5	56.9	51.5
1973	51	2.0	21.0	5.1	53.7	48.5
1974	51	2.0	21.0	4.6	48.3	43.7
1975	51	2.0	21.0	4.3	44.3	40.0
1976	51	2.0	21.0	3.9	41.9	37.9
1977	51	2.0	21.0	3.7	39.3	35.6
1978	51	2.0	21.0	3.5	36.5	33.0
1979	51	2.0	21.0	3.2	32.9	29.7
1980	51	2.0	21.0	2.7	28.9	26.2
1981	51	2.0	21.0	2.5	26.2	23.7
1982	51	2.0	25.0	2.4	29.4	27.0
1983	51	2.0	26.0	2.3	29.6	27.3
1984	51	2.0	26.0	2.2	28.4	26.2
1985	51	2.0	26.0	2.1	27.5	25.3
1986	51	2.0	31.0	2.1	32.1	30.0
1987	51	2.0	38.0	2.0	38.0	36.0

[a]Includes District of Columbia.
SOURCE: Tobacco Institute (1988).

cigarettes in neighboring lower tax jurisdictions for their own consumption), illegal organized or commercial smuggling for resale, tax-free mail order purchase of cigarettes (technically illegal since 1949), purchase of cigarettes through tax-free outlets (international ports of entry, military stores, and Indian reservations), and illegal diversion of cigarettes within the traditional distribution system (forged tax stamps and underreporting) (Advisory Commission on Intergovernmental Relations (ACIR) 1977, 1985).

As the differential in State tax rates increased during the late 1960s and early 1970s, the level of cigarette tax evasion increased substantially. Although casual smuggling between neighboring States (e.g., Massachusetts and New Hampshire, Washington and Oregon) had long been a problem, government officials reported a substantial increase in organized smuggling over long distances and in the illegal diversion of cigarettes from the legal distribution system (ACIR 1977). The problem was also reported in the media. In response, the Federal Cigarette Contraband Act was enacted. It prohibited the transportation, receipt, shipment, possession, distribution, or purchase of more than 60,000 cigarettes not bearing the indicia of the State in which the cigarettes were found. Enforcement of this Act was made the responsibility of the Bureau of Alcohol, Tobacco, and Firearms of the U.S. Treasury Department. A second study by the Advisory Commission on Intergovernmental Relations (1985) suggested that this act had been effective in reducing the level of organized smuggling. ACIR (1985) has suggested earmarking a portion of the revenue generated by increases in State cigarette excise taxes for antismoking law enforcement activities.

The law enforcement problems stemming from organized interstate cigarette bootlegging were also a factor in the deceleration of State tax increases in high-tax States (ACIR 1985). In real terms, the difference between the rate in the highest and lowest rate States (53 cents, 1987 value) peaked in 1971. The decline in the range of real prices means that interstate bootlegging has become less profitable since that time. This decline in profitability, combined with the increased Federal enforcement effort, probably accounted for the decline in bootlegging (Warner 1982). More recent increases in State taxes and the resultant widening of real differentials between high- and low-tax States have again increased the incentives for smuggling. In addition, many States and the FederalGovernment have reduced the level of resources allocated to enforcing State tax laws as the problem of bootlegging abated.

Cigarettes sold on military bases and Indian reservations are exempt from State and local tobacco excise taxes. Tax-exempt sales at these locations represent a revenue loss to the States, which would collect a tax on these sales if the tax-exempt options did not exist. These cigarette sales represent "the major sources of current revenue losses for most states" (ACIR 1985). In 1986, DOD discussed but did not adopt a proposal to remove the State and local tax exemption for cigarettes sold in the military, as part of an overall strategy to discourage smoking in the military (US DOD 1986c).

Effects of Excise Taxes on Smoking and Health

Price Elasticity of Demand for Cigarettes

One of the few nearly universal relationships in economics is the law of downward sloping demand; that is, demand for a commodity declines as its price increases. Numerous econometric studies have confirmed that this relationship holds for cigarettes. Because excise taxes increase the price of cigarettes, fluctuations in excise tax rates should influence the demand for cigarettes, and excise tax increases should reduce tobacco consumption.

The basis for estimating the consumption effects of a change in excise tax rates is an analysis of the price elasticity of demand for cigarettes. Elasticity, a measure of the degree of responsiveness of demand to changes in price, is defined as the percentage change in the quantity of cigarettes demanded divided by the percentage change in price. An elasticity of –0.5, for example, means that a 10-percent increase (decrease) in price would reduce (increase) by 5 percent the quantity of cigarettes demanded. Because cigarette taxes account for only a fraction of the total retail price of cigarettes, the price elasticity of demand would have to be multiplied by the percentage change in price that resulted from a tax change to determine the elasticity of demand with respect to the tax. Accordingly, the elasticity of demand with respect to a tax change will be less than the price elasticity of demand.

Numerous attempts have been made to measure the price elasticity of demand for cigarettes, with estimates ranging from –0.2 to –1.3. Miller (1982) suggested that –0.7 was the midpoint of recent studies and noted that the Tobacco Institute used that figure for its analyses of cigarette tax effects. Table 12 reports the results of studies published since 1980 on the price elasticity of demand for the United States. The substantial changes in the market for cigarettes and in the demographics of the smoking population that have occurred since 1964 suggest that earlier estimates may be inappropriate today.

The estimates reported in Table 12 derive from econometric studies that attempt to explain differences in cigarette consumption as functions of the price of cigarettes, income, and demographic variables. Some of the variability in results is a consequence of methodological differences among studies. The studies derive estimates of demand from different sources, including time series of per capita cigarette consumption (for the United States as a whole and for cross-sections of States) and cross-sectional survey data on the smoking behavior of individuals at a point in time and over time. Each of these methods has inherent limitations that can cloud the interpretation of results. In time series studies, the estimates of price and income elasticities are sensitive to the method of accounting for the effects of concurrent social influences on smoking, such as the growing public knowledge about its harmful effects and changing cigarette advertising policies. In addition, time series estimates are not stable because the independent variables tend to be highly correlated with each other. Moreover, price elasticities estimated with time series data may represent short-term responses to price fluctuations rather than the long-term responses that are typically of greater interest to policymakers.

On the other hand, estimates of cigarette price elasticities based on cross-sections of State tax-paid sales may be biased upward because some cigarettes sold in low-tax States are ultimately consumed by smokers in higher tax States. As a result, tax-paid sales may overstate actual consumption in low-tax States and understate consumption in high-tax States, and the estimated price elasticity of sales will exceed the price elasticity of actual consumption. Some studies have attempted to control for short-distance, casual smuggling (ACIR 1977, 1985; Becker, Grossman, Murphy 1987; Chaloupka and Saffer 1988) and long-distance, organized smuggling (Becker, Grossman, Murphy 1987; Chaloupka and Saffer 1988) by using a set of carefully constructed variables. While these are imperfect measures of the smuggling phenomena, the careful attempt to control for the problem should reduce the bias associated with the use of this type of data.

TABLE 12.—Recent estimates of the price elasticity of demand for cigarettes

Study	Estimated aggregate price elasticity	Method of estimation	Comments
Fujii (1980)	–0.45	Ridge regression	Time-series aggregate data, 1929–73
Schneider, Klein, Murphy (1981)	–1.23	Instrumental variables	Time-series aggregate data, 1930–78
Lewit, Coate, Grossman (1981) Teenage smoking	–1.44	Ordinary least-squares	U.S. Health Examination Survey, 12–17-year-olds, 1966–70
Lewit and Coate (1982) Adult smoking	–0.42	Ordinary least-squares	1976 Health Interview Survey, elasticities by age and sex, 20–74-year-olds
Young (1983)		Ridge regression	Fujii's model with asymmetrical responses
Price increase	–0.33		
Price decline	–0.61		
Bishop and Yoo (1985)	–0.45	Three-stage least-squares	Time-series aggregate data, U.S., 1954–80
ACIR (1985)	–0.45	Ordinary least-squares	Pooled-time series of State cross-sections, 1981–83
Mullahy (1985)	–0.47	Probit, instrumental variables	1979 Health Interview Survey, by sex
Baltagi and Levin (1986)	–0.14	Instrumental variables	Pooled-time series cross-section of 46 States, 1963–80
Porter (1986)	–0.27	Two-stage least-squares	Time-series aggregate data, 1947–82
Chaloupka (1988) Long run	–0.26– –0.40	Instrumental variables	HANES2 full sample; also by age, sex, race, or education
Becker, Grossman, Murphy (1987) Long run	–0.75	Instrumental variables	Pooled-time series of State cross-sections, 1956–85
Chaloupka and Saffer (1988)	–0.28	Two-step endogenous law model	Pooled-time series of State cross-sections, 1975–85

An additional limitation of most econometric studies is that they use aggregate or per capita cigarette consumption as their dependent variable. As a result, they provide estimates of the price elasticity of aggregate or per capita cigarette consumption but can provide no information on the effects of price changes on smoking rates, smoking cessation and initiation, or quantity and type of cigarette smoked by smokers. Also, they cannot identify differences by separate demographic groups in response to price changes. Accordingly, aggregate studies are useful for economic and fiscal planning but are of limited usefulness when considering the behavioral or health effects of changes in cigarette tax policy.

In contrast to studies focused on aggregate consumption effects, Lewit and colleagues (1981, 1982) used data on individuals from two national surveys to investigate the effects of price (tax) differences on smoking behavior. With data on a sample of 19,288 individuals aged 20 through 70 years from the 1976 NHIS, Lewit and Coate (1982) estimated an overall price elasticity of –0.42 for cigarettes. They corrected for bias in two ways: first, by using consumption reported by individuals rather than tax-paid sales as the unit of observation, and second, by removing from the sample those households within 20 miles of States with lower prices. The former eliminates some of the error in the measurement of consumption, and the latter partially corrects for errors in the price measure that result when households purchase cigarettes outside their own localities.

Lewit and Coate's study also gave a more detailed breakdown of the smoking response than in previous studies. They found that cigarette prices affected smoking primarily by reducing smoking prevalence (the "participation rate," or number of smokers). The estimated effects on the number of cigarettes per smoker were not statistically significant. There were also differences in the estimated price elasticities among groups; reported price elasticities were much higher for adult males than for adult females and much higher for people aged 20 to 25 years than for other age groups. Their estimates are summarized in Table 13.

In a methodologically similar study, Lewit, Coate, and Grossman (1981) analyzed teenage smoking by using data from Cycle III of the U.S. Health Examination Survey (HES), a national sample of 6,768 youths between the ages of 12 and 17 years who were surveyed between March 1966 and March 1970. They reported that price elasticities of demand for cigarettes among teenagers are larger in absolute value than price elasticities for adults. As in the adult study, smoking participation (or prevalence) is more responsive to price than is the quantity of cigarettes smoked. Their estimated smoking participation elasticity for teenagers was –1.20, and the quantity-smoked elasticity (conditional on smoking) was –0.25 (Table 13).

The estimated elasticities based on HES data for teenagers were generally confirmed in a related study by Grossman, Coate, and Lewit (1983) and summarized by Grossman (1983). The study used a similar methodology to estimate price elasticities for teenagers on the basis of the four U.S. National Surveys on Drug Abuse (NSDA) conducted in 1974, 1976, 1977, and 1979. Estimates based on these surveys must be interpreted with caution because they are based on much smaller samples than those from the previous studies. Adjusting for this fact, Grossman's summary estimate of NSDA

TABLE 13.—Estimates of the price elasticity of demand for cigarettes

Age group (years)	Elasticities		
	Total	Participation	Quantity per smoker
12–17	−1.40	−1.20	−0.25
20–25	−0.89	−0.74	−0.20
26–35	−0.47	−0.44	−0.04
36–74	−0.45	−0.15	−0.15
All adults (20–74)	−0.42	−0.26	−0.10
All ages (12–74)	−0.47	−0.31	−0.11

SOURCE: Lewit and Coate (1982); Lewit, Coate, Grossman (1981); Lewit (1985) and unpublished calculations by Lewit.

participation elasticity was −0.76, which is smaller in absolute value than the HES estimate but almost 3 times larger than the NHIS elasticity for adults.

Most economic studies of the demand for cigarettes, including those cited above, have not explicitly allowed for the addictive nature of cigarettes (US DHHS 1988). Part of the reason for this omission was that the consumption of addictive goods in general was not thought to conform to the rational, utility-maximizing model that is the paradigm of standard economic analysis. Recently, however, Becker and colleagues (Becker, Grossman, Murphy 1987; Becker and Murphy 1988), among others, have developed models of "rational addiction" that are conducive to economic analysis. In general, this work recognizes that the demand for cigarettes depends on the levels of both past and future consumption, permitting incorporation of the notions of tolerance, reinforcement, and withdrawal, which are generally used to distinguish addictive from nonaddictive substances.

The findings of preliminary empirical research are consistent with the characterization of smoking as an addiction and suggest that failure to consider addiction explicitly may lead to underestimation of the long-term response to changes in cigarette price (Becker, Grossman, Murphy 1987; Chaloupka 1988). The application of the rational addiction model to cigarette consumption is a recent development that will require further empirical investigation and theoretical refinement before its contribution to the understanding of smoking behavior can be fully evaluated. The range of estimates of the long-term price elasticity of demand for cigarettes derived under the assumptions of the model is not inconsistent with previously published estimates, however, which suggests that insights gained from analyses of recent tax increases are not likely to be invalidated by further refinement of the addiction model.

The principal message of this body of research on price elasticity of demand is that an increase in the price of cigarettes appears to curtail smoking, particularly the initiation of smoking by teenagers. Because adolescents are more responsive to changes in cigarette prices than are adults and because price changes appear to have stronger effects on smoking prevalence than on daily consumption by smokers, the studies suggest that excise tax increases may be useful tools to prevent or delay the onset of smoking by adolescents.

Because aggregate cigarette consumption and smoking prevalence are dominated by the behavior of adults, the short-term effects of an increase in cigarette excise taxes would likely be modest. The long-term impact of such an increase could, however, be considerably more substantial. If the current situation, in which very few individuals start smoking after age 20 (see Chapter 5) continued, it is possible that the cohort of young persons who do not begin to smoke as a result of a tax increase would never become smokers. If the tax increase were maintained in real terms, it could continue to discourage successive generations of youths from starting to smoke. Gradually, the smoking prevalence of adults might be reduced as these cohorts moved through the age spectrum. Over a period of several decades, aggregate smoking and its associated health effects might decline more substantially than would be evident in the years immediately following a tax increase.

In addition to its relevance for cigarette taxation, research demonstrating the inverse relationship between tobacco price and demand has implications for the armed forces. As described in Chapter 5, the prevalence of smoking among military personnel exceeds that of the general population. One factor probably contributing to the differential in smoking rates is the lower price paid by military personnel for tobacco products. The current pricing structure of the military resale system results in approximate 35-percent and 18-percent reductions in cigarette price in military commissaries and exchanges, respectively, when compared with commercial retail outlets (US DOD 1986c). Cigarettes sold in these military stores are exempt from State and local excise taxes and, if outside the United States, are also exempt from the Federal excise tax. Cigarette sales in the military resale system totaled 1,046 million packs in fiscal year 1985, though sales have been decreasing in the 1980s (US DOD 1986c, 1987). Price elasticity of demand data suggest that increasing the price of cigarettes could contribute to reducing tobacco use by military personnel. In 1986, DOD considered banning the sale of tobacco in commissaries or raising the price of tobacco products on military installations as part of a broad program to discourage tobacco use. Neither of these policies was adopted (US DOD 1987), although, as discussed in Part III and Chapter 6, DOD has instituted new smoking restrictions and has launched antismoking activities on a large scale.

Effects of an Excise Tax Increase

Research addressing the temporary doubling of the Federal excise tax in 1983 and its six temporary extensions prior to permanent adoption in 1986 generated several estimates of the effect of the tax increase on cigarette consumption and smoking prevalence. For example, Harris (1982) used the Lewit-Coate estimate of the adult-smoking participation price elasticity of –0.26 and the Lewit-Coate-Grossman estimate of the teenage-smoking participation price elasticity of –1.20 to forecast the impact of the doubling of the Federal excise tax rate in 1983. He predicted that the number of adult smokers would decline by 1.5 million and the number of teenage smokers by 0.7 million.

In an analysis performed in 1985, during the period of uncertainty as to whether the Federal tax increase would be extended permanently or allowed to lapse, Warner (1986a) used the Lewit-Coate and Lewit-Coate-Grossman age-specific elasticity estimates to project the changes in cigarette consumption that would have accompanied an 8-cent tax decrease or 8- and 16-cent tax increases (Table 14). Altogether he estimated that an 8-cent decrease in the tax would induce almost 2 million persons to smoke who would not do so if the tax were to remain unchanged at 16 cents per pack. In contrast, a doubling of the tax to 32 cents per pack would have encouraged almost 3.5 million Americans to forego smoking, a figure that included more than 800,000 teenagers and almost 2 million young adults aged 20 to 35 years.

TABLE 14.—Expected percentage changes in cigarette consumption resulting from changes in the Federal cigarette excise tax

Age group	8-cent decrease		8-cent increase		16-cent increase	
	Total consumption	Smoking prevalence	Total consumption	Smoking prevalence	Total consumption	Smoking prevalence
12–17	11.9	10.2	–11.1	–9.5	–21.1	–18.1
20–25	7.6	6.3	–7.0	–5.9	–13.4	–11.2
26–35	4.0	3.7	–3.7	–3.5	–7.1	–6.6
36–74	3.8	1.3	–3.6	–1.2	–6.8	–2.3
All adults (20–74)	3.6	2.2	–3.3	–2.1	–6.3	–3.9

SOURCE: Warner (1986a).

Lewit (1985) examined the actual decline in aggregate cigarette consumption following the 1983 tax increase. He noted that in anticipation of the January 1, 1983, tax increase, the tobacco companies increased the wholesale price of cigarettes four times between August 1982 and January 1983. Cigarette prices were increased twice again in 1983, and 16 States increased their cigarette excise taxes during 1982 and 1983. As a consequence, the average retail price of cigarettes increased by about 40 percent between November 1, 1981, and November 1, 1984, from approximately 70 cents per pack in 1981 to almost 98 cents in 1984 (Tobacco Institute 1988). During this same period, the price of cigarettes adjusted for inflation rose by 26 percent. Based on an overall price elasticity of –0.47 for adults and teenagers, per capita consumption should have declined by about 12 percent over this period. Department of Agriculture data indicate a decline of 11 to 12 percent. Although per capita cigarette consumption had been slowly declining at the rate of about 1 percent per annum since the mid-1970s, the very rapid acceleration in the rate of decline following the excise tax increase and associated price increases is consistent with the cross-sectional studies and serves as further evidence that excise taxes may be a potent tool to discourage smoking.

Harris (1987) conducted an extensive review of the 1983 Federal tax increase. On the whole, his findings for the period 1981–86 are consistent with those reported by Lewit (1985). Harris' discussion of the cigarette manufacturers' response to the tax increase is, however, of particular interest. It has been generally assumed that changes in tax rates would be fully passed on to consumers. Accordingly, Warner's analysis (1986a) and Harris' earlier analysis (1982) assumed that an 8-cent tax increase would raise the retail price of cigarettes by 8 cents. Harris (1987) reports evidence to suggest, however, that the preannounced 1983 Federal tax increase appeared to have served as a focal point for coordinating an oligopolistic price increase by tobacco producers that exceeded the amount of the tax. He concludes that "Quite contrary to the conventional view of the incidence of excise taxes, the federal excise tax may have actually had a multiplier effect upon price." He estimates that the 8-cent-per-pack tax increase induced a 16-cent-per-pack increase in the market price of cigarettes.

Health Consequences of Tax Changes

Given the deleterious health effects of cigarette smoking and the important changes in both cigarette consumption and smoking prevalence that would accompany a substantial tax change, it appears that a policy of aggressive increases in the tax on cigarettes would lead to large reductions in smoking-induced illness. To assess fully the effect of a cigarette tax change on the health of the population, information is needed on who actually cuts down on cigarettes, who quits, and who does not start smoking. Only a portion of such information is available.

However, both Warner (1986a) and Harris (1987) provide crude estimates of some of the health effects that may result from the 1983 Federal tax increase. Basing his estimates on the conservative assumption that one lifelong smoker out of every four dies of smoking-related illness (Mattson et al. 1987), Warner obtained upper bound estimates of the mortality impact of increases or decreases in the Federal excise tax. He estimated that an 8-cent tax increase, maintained in real value over time, would avert 450,000 premature deaths in the cohort of Americans 12 years of age and older in 1984 and that this number would rise to 860,000 following a 16-cent increase. An 8-cent tax decrease, however, would result in an increase of more than 480,000 premature smoking-induced deaths.

Focusing specifically on the post-1983 tax-induced price changes and their impact on consumption, Harris estimated that 100,000 additional persons will live to age 65 as a result of the tax increase. Of these 100,000, he estimated that 54,000 will result from having discouraged 600,000 teenagers from starting to smoke. Thus, the major effect of the tax increase on mortality will not be realized for decades. On the other hand, although no estimates of the impact of the tax increase on other health measures have been published, reductions in smoking-induced morbidity and disability should raise aggregate health levels long before the projected mortality reductions are fully realized.

Policies Under Consideration

Among the public policy tools with a potential to reduce tobacco use, the cigarette excise tax has received particular attention because its public health benefits are well documented, and it has the additional advantage of generating public revenues (Warner et al. 1986b). Currently discussed proposals to modify Federal, State, or local cigarette excise taxes fall into two categories: (1) proposals to increase the amount of the tax or the method of calculating the tax rate, and (2) proposals to channel the revenues generated from excise taxes for specific purposes. The first category includes proposals to increase the Federal excise tax rate, raise State and local excise tax rates (especially in States in which rates are currently below the national or regional average), and switch from a specific unit tax to an ad valorem tax, thereby tying the tax rate to a measure that changes with inflation. This last proposal often accompanies the others because it permits the real tax rate to keep pace with inflation. Proposals in the second category would dedicate (or earmark) some portion of tax receipts for purposes such as funding tobacco control programs or paying for the excess health care costs of smokers.

Tobacco Excise Tax Increases

Increasing the Federal excise tax beyond the 16-cent-per-pack level first set by Congress in 1983 and made permanent in 1986 is the most widely discussed and most broadly supported tax proposal. It has been endorsed by a wide range of voluntary health organizations and organized medical societies, including the American Medical Association, American Public Health Association, American Cancer Society, American Heart Association, and American Lung Association. Proponents of a Federal excise tax increase note that the real value of the tax has fallen since 1964 and that inflation since the last increase in 1983 has continued to erode the real value of the tax. Opponents of Federal excise tax increases have raised several issues, primarily based on tax equity considerations. Chief among them is that cigarette excise taxation is regressive, requiring the poor to pay a greater proportion of their income on the tax than the rich. More pragmatic concerns have been raised about the effect on State tax revenues. Because the consumption of cigarettes tends to decline as price rises, State cigarette tax receipts may fall after a Federal tax increase if State tax rates remain constant. In the aggregate, this did not happen after the 1983 Federal excise tax increase because State tax rates also increased.

Increases in State excise taxes have received less attention, although the effect of such a policy change on consumption and revenue would be expected to resemble that of a Federal tax change. The variability in State taxes adds an additional concern about interstate bootlegging of cigarettes, which could be avoided if excise tax rates were preferentially raised in States with relatively low tax rates. Beyond excise tax changes, cigarette taxes could also be increased in those States that now exempt cigarettes from the regular sales tax by removing that exemption. Massachusetts did so in June 1988, resulting in a 5-cent increase in the tax on cigarettes (Mohl 1988).

Switch to an Ad Valorem Tax

With the exception of the State excise tax in Hawaii, all Federal, State, and local cigarette taxes are specific unit taxes; that is, the tax rate is a constant nominal amount per unit. While a specific unit excise tax has the advantage of administrative simplicity, it has the disadvantage that the real revenue yield tends to decline with inflation. Unit excise taxes must be raised periodically if real revenues—and consequent impact on tobacco consumption—are to be maintained. Replacing unit taxes on cigarettes and other tobacco products with equivalent-yield ad valorem taxes would allow revenues to keep pace with inflation-induced increases in cigarette prices, and real cigarette prices would be more likely to be maintained over time. As mentioned above, Federal taxes on large cigars and most State taxes on noncigarette tobacco products are ad valorem taxes. An alternative to switching to an ad valorem tax on cigarettes is to index the unit tax to changes in either the general price level or to a price index for cigarettes (Toder 1985). This would maintain the administrative simplicity of per-unit taxes and eliminate the need to periodically reevaluate the unit tax rate to maintain real revenues.

Earmarking of Revenues

Tobacco taxes may also be earmarked (dedicated) for specific tobacco- or health-related purposes. Proposals have included using tax revenues to support the cost of health care for tobacco-related illnesses or to fund tobacco prevention and cessation programs delivered in schools or via the media (Warner 1986c). Earmarking a portion of the Federal cigarette excise tax to fund the medicare program has been proposed to Congress (Committee on Ways and Means 1986), and survey data show that a majority of the public would support an increase in the cigarette excise tax to fund medicare (Chapter 4).

Several States have used cigarette tax revenues to finance tobacco-related health programs. In Nebraska, revenue from a 1-cent-per-pack cigarette tax is used to fund the State's Cancer and Smoking Disease Research Program (CDC 1987). In Minnesota, the Omnibus Nonsmoking and Disease Prevention Act of 1985 increased the cigarette excise tax by 5 cents per pack and earmarked 1 cent of the additional revenues for a public health fund. As noted previously, one-quarter of this fund is dedicated to assist local school boards to implement tobacco use prevention programs. Funds are also provided for an active public tobacco control and prevention program overseen by the Commissioner of Health (Minnesota Department of Health 1987a,b). In Utah, a portion of revenues generated from an 11-cent increase in the State cigarette excise tax is dedicated for tobacco control programs (Utah 1987). A newer proposal would earmark a portion of the estimated excise tax revenue generated from sales of tobacco products to minors to support tobacco prevention and cessation programs for youth (Slade 1988a). In Indiana, a portion of the State tobacco excise tax is earmarked to support subsidized child care programs (Lewin 1988).

The most substantial earmarking of tobacco excise tax revenues is in California, the result of passage of a ballot initiative in November 1988 raising the State's cigarette excise tax by 25 cents per pack. With the exception of funds to cover the administrative and collection costs associated with the tax, three-quarters of all revenues are dedicated to health education, research, medical treatment, and environmental conservation programs. In its first full year of operation, the tax is expected to generate 650 million dollars for these purposes (Tobacco Tax and Health Protection Act of 1988; Wilson 1988b).

Insurance and the Treatment of Smokers

At the time of the 1964 Surgeon General's Report, whether a person smoked was not a consideration in the premiums paid for insurance. No major life, health, disability, homeowner, or auto insurer offered discounts to nonsmokers, and no major health insurer covered the expenses of smoking cessation programs. In fact, the consensus of a panel of the Society of Actuaries convened in 1963 was that consideration of smoking in calculating life insurance premiums seemed to be impractical (November et al. 1964).

Over the subsequent 25 years, this situation has changed considerably, but changes have come at different rates in the three major segments of the insurance industry—life, health and disability, and property and casualty. Currently, almost all life insurers, including two that are subsidiaries of major tobacco firms, offer premium discounts to individuals who do not smoke cigarettes (Trenk 1986). In contrast, only about 15 percent of companies writing health and disability insurance policies offer discounts to nonsmokers, and even fewer reimburse health care providers for smoking cessation treatment (National Association of Insurance Commissioners (NAIC) 1987c). Only 1 of the 10 leading writers of homeowner and personal passenger auto policies offers discounts to nonsmokers on both (Wasilewski 1987a,b). Although the underwriting practices and administrative exigencies vary considerably among these three types of insurance, sentiment has been building for insurers, primarily those in life and health, to offer premium differentials and cover the costs of smoking cessation treatment (Brailey 1980; Stokes 1983; Davis 1986; Engstrom 1986; Walsh and Gordon 1986; US DHHS 1988).

Premium differentials based on smoking behavior are generally referred to as nonsmoker discounts rather than as smoker surcharges. The terminology, which implies that smoking is the majority condition, is no longer correct, but it persists for historical and marketing reasons; the premium differentials were developed when smoking was a more common behavior, and a discount sounds like a positive incentive, while a surcharge has the negative connotation of a penalty. Smoker–nonsmoker premium differentials are the result of insurer business decisions, based primarily on differences between insured smokers and nonsmokers in mortality rates, health care costs, and auto and homeowner claims. For the policyholder, a premium differential may serve as an economic disincentive for smoking.

This Section will examine separately each of the three major industry segments to address the extent to which insurers in each category consider policyholder smoking status when calculating premiums or coverage, reasons the three segments handle the issue differently, and the potential effects of the insurance industry's premium structure and reimbursement policies on smoking behavior.

Life Insurance

Life insurance policies are sold on an individual, family, or group basis. Policies purchased on an individual or family basis are referred to as ordinary life insurance and are the most common type of life insurance. Sixty-two percent of households in the United States had ordinary life insurance policies in 1987 (American Council of Life Insurance (ACLI) 1987).

Life insurers price their products according to the mortality experience of the insured population. Higher premiums are set for classes of individuals with greater mortality rates. Smoker–nonsmoker premium differentials were adopted by the industry when actuarial studies confirmed that the excess mortality of smokers, previously observed in epidemiologic studies, was also present in the insured population (Cowell 1985). Some insurers offer an alternative to smoker–nonsmoker premium differentials. These policies are based on overall health behavior or health status and are typically available only to applicants who meet health standards with regard to weight, blood pressure, and exercise and who do not smoke.

History of Premium Differentials

Three months after the 1964 Surgeon General's Report was released, State Mutual Life Assurance Company became the first company to offer life insurance to nonsmokers at discounted rates. The company believed that its statistical evidence of "much higher death rates among persons who smoke was so overwhelming that the company could no longer ignore it in pricing insurance" (Cowell 1985; Cowell and Hirst 1980). This action was consistent with a position that nonsmokers should not subsidize the higher insurance costs resulting from smokers' excess death claims.

Between 1965 and 1975, more than 30 other companies introduced premium discounts for nonsmokers, based on their estimates of the effects of smoking on mortality in the insured population. Their estimates resulted at least partly from examination of mortality studies discussed in the early Surgeon General's Reports (Crowne and Shapiro 1980). However, most of the industry did not develop nonsmoker premium discounts at that time. Their reluctance derived primarily from a paucity of actuarial data. Furthermore, only half of the primary market of policyholders—adult males—stood to benefit from these discounts, because in 1965, 50 percent of adult males smoked (Chapter 5). Companies also had to address the uncertainties of marketing and administering a new product. These factors were sufficient to slow the adoption of smoker–nonsmoker premium differentials (Cowell 1985; Cowell and Hirst 1980).

In 1979, State Mutual analyzed the mortality differences between its insured smokers and nonsmokers. The analysis showed that the overall mortality of smoking policyholders was 2 to 2 1/2 times that of nonsmoking policyholders. The higher death rates of smokers were not confined to older ages but were apparent even at early ages. These findings were statistically significant and large enough to be used for insurance underwriting and pricing purposes (Cowell and Hirst 1980). This landmark report was a stimulus to rapid change in the industry. After State Mutual made public its experience, so did other life insurers, including those that had previously not issued their findings in the mistaken belief that the differences were too large to be true. Within 3 years, 400 companies offered discounted premiums to nonsmokers (Shaman 1982).

In 1983, at the request of NAIC, a Society of Actuaries' task force examined the smoking-related mortality data of insurance companies. The Task Force on Smoker/Nonsmoker Mortality determined the mortality differences between smoking and nonsmoking insured persons of ages 15 to 99 years and divided the mortality tables used to value the reserves on life insurance into those appropriate for pricing separate smoker and nonsmoker products. The group did not specifically address the nature of the association between smoking and increased mortality that it so clearly observed. For their purposes, it was sufficient only that premium rates reflected the actual mortality experience of groups of insured smokers and insured nonsmokers (Society of Actuaries 1983).

By addressing these issues, the task force facilitated greater acceptance of smoker–nonsmoker premium differentials by insurance companies and the State government officials who regulate them. NAIC used the Society of Actuaries' work to develop the "Model Rule (Regulation) Permitting Smoker/Nonsmoker Mortality Tables For Use In Determining Minimum Reserve Liabilities and Nonforfeiture Benefits" (NAIC 1985b). The rule permitted insurers to use standard underwriting and actuarial practices to set different premium rates for smokers and nonsmokers, as insurers would for any other accepted risk classification in their normal conduct of business. Proposed in January 1984 to Commissioners of Insurance in all States, the model rule or a similar variation had become law in 33 States as of July 1987 (NAIC 1987f).

Once the empirical basis for smoker–nonsmoker premium differentials was established, life insurers had to consider how to market and administer the new products. A central concern was the possibility that individuals would misrepresent their smoking status (Lipson 1988). Misrepresentation is not a new problem; insurance companies have had to deal with it since their beginning. One solution was to require biochemical validation of nonsmoking status. A growing number of insurers now require this validation before selling a policy (Lyons 1986). One reason nonsmoking discounts are less often offered on group policies is that persons within groups are rarely examined or have their smoking status verified (Brailey 1980).

A second approach has been to investigate claims made by nonsmokers. When confronted with a claim from an individual who has misrepresented his or her smoking status, insurance companies have usually done one of the following: (1) reduced the benefit to the amount that the premium actually paid would have purchased for a smoker, (2) paid the claim in full, (3) returned the premiums paid with interest, (4) deducted the premium differential from the benefits, or (5) rescinded the policy and refused to pay. How often insurers use each of these options is not known, but the last option, by far the most severe deterrent to misrepresentation, has recently garnered much industry support (Lyons 1986). It has also been upheld in the courts. In a January 4, 1988, decision in *Mutual Benefit Life Insurance Company* v. *JMR Electronics Corp.*, the U.S. District Court of the Southern District of New York absolved the insurer of liability for a policy where the insured had misrepresented his smoking status:

> To allow recovery would condone such fraudulent Statements, for applicants would have everything to gain and nothing to lose by gambling on getting full coverage and at worst

getting the coverage they are actually entitled to (Tobacco Products Litigation Reporter 1988).

In May 1988, the U.S. Court of Appeals upheld that opinion (Hagedorn 1988).

Current Status of Premium Differentials

In 1987, 89 percent of 215 companies responding to an industry survey reported that they offered health-behavior-related discounts on individual life insurance policies; 14 percent also offered them on group life insurance policies. Almost all of these health-behavior-related discounts included discounts to nonsmokers (Center for Corporate Public Involvement 1987).

Thirty percent of all individual life insurance policies purchased in the United States and 39 percent of the amount of coverage are so-called universal life policies, which offer the policyholder the option of varying the amount of coverage or the timing of premium payments (ACLI 1986). All of the top five life insurers, which as a group are responsible for 23.4 percent of life insurance premiums generated in the United States, offer nonsmoking discounts on universal policies, varying by the age of the insured by as much as 30 percent (A.M. Best 1987a). Nineteen of the top 25 companies, responsible for 46 percent of the total amount of life insurance premiums, offered universal policies in 1987 (A.M. Best 1987a). Of those 19 companies, 16 gave discounts to nonsmokers, some as high as 40 percent for both males and females. Discounts varied by the age and sex of the insured (Table 15). The discounts were smallest for younger persons, increased steadily to a peak at age 45 years, and dropped slightly for older individuals. At all ages, discounts were larger for men than for women. The average discounts for newly insured males and females in 1987 ranged from 12.5 to 22.5 percent.

TABLE 15.—Average premium discount (%) offered to nonsmokers purchasing universal life insurance policies, 1986–87

	Average age (years)			
	25	35	45	55
Male	14.5	18.1	22.5	20.4
Female	12.5	14.3	17.0	16.5

NOTE: Discounts based on the minimum amount of insurance that can be purchased.
SOURCE: A.M. Best (1987a).

The average dollar amount of discounts varied not only by sex and age but also by policy amount (Table 16). Savings for nonsmokers increased with the amount of the policy and the age of the insured, and they were larger for men than for women. The average size of an ordinary life insurance policy *in force* in 1986 was 25,538 dollars (ACLI 1987). On a 25,000 dollar policy written for males, the annual savings in premium cost ranged from 15 dollars at age 25 to 114 dollars at age 55. Savings on the same size policy written for females varied between 10 dollars at age 25 and 61 dollars

TABLE 16.—Average difference ($) between annual premiums paid by smokers and nonsmokers purchasing universal life insurance policies, 1986–87

	Age (years)			
Policy amount	25	35	45	55
$25,000 policy[a]				
Male	15	30	72	114
Female	10	18	39	61
$50,000 policy[b]				
Male	48	79	170	299
Female	34	55	109	192

NOTE: Figures are based on policies offered by the 25 largest life insurers.
[a]Average value of an ordinary (individual) life insurance policy in force in 1986 was 25,538 dollars (ACLI 1987). Not all companies offer this amount of coverage.
[b]Average value of an ordinary (individual) life insurance policy purchased in 1986 was 55,535 dollars (ACLI 1987).
SOURCE: A.M. Best (1987a).

at age 55 (A.M. Best 1987a). The average size of ordinary life insurance policies *purchased* in 1986 was 55,535 dollars (ACLI 1987). Annual savings on a 50,000 dollar policy averaged from 48 dollars at age 25 years to 299 dollars at age 55 in men, and from 34 dollars at age 25 years to 192 dollars at age 55 in women (A.M. Best 1987a).

Health Insurance

Approximately 85 percent of Americans are covered by health insurance, which is most frequently offered by commercial carriers, Blue Cross–Blue Shield (BC/BS) plans, and health maintenance organizations (HMOs). Unlike life insurance, which is largely sold to individuals and families, 80 percent of health insurance is purchased on a group basis, usually as an employment benefit (Health Insurance Association of America (HIAA) 1987). As a result, these policies are seldom tailored to individual health profiles or health risks to the degree common in individual life insurance underwriting, where a physical examination is typically required before a policy is written. In keeping with this situation, smoker–nonsmoker premium differentials are much less commonly offered by health than by life insurers, as described below.

Current Status of Premium Differentials

Individual health insurance policies are far less common than group plans. They account for only 20 percent of the health insurance market (HIAA 1987). The most complete study of premium differentials for individual health and disability policies was conducted in 1987 by NAIC (NAIC 1987a,b,c,d), which sent a survey to all 603 carriers offering individual health and disability insurance in Illinois and all BC/BS plans in the United States. Seventy-six percent of commercial carriers and 77 percent of

BC/BS plans responded. Fourteen percent of the commercial carrier respondents either offered discounts to nonsmokers or imposed surcharges on smokers for health (hospital–medical) or disability (loss of income) policies. Sixteen percent of BC/BS plans offered discounts to nonsmokers on hospital–medical policies. Average nonsmoker discounts on health insurance offered by commercial carriers ranged from 9 to 15 percent, with an industry average of 10 percent. Average discounts offered by the BC/BS plans ranged from 8 to 10 percent, with an industry average of 9 percent. For disability policies, the average nonsmoker discount ranged from 3 to 14 percent, with an industry average of 8 percent, whereas the average smoker surcharges ranged from 10 to 14 percent, with an industry average of 13 percent.

Health insurers are much less likely to offer nonsmoker discounts with their group health products, despite an NAIC resolution supporting premium differentials in group as well as in individual health policies (NAIC 1985a). In 1980, Provident Indemnity Life Insurance Company became the first to use smoking as a risk factor in establishing health insurance premiums for small groups (less than 25 employees) (Hellauer 1988). Few insurers have followed suit.

The use of smoking status in the calculation of premiums for HMOs has been slowed by Federal regulations. Federally qualified HMOs were required by the original HMO Act of 1973 (Public Law 93-222) to calculate their group premiums by community rating, reflecting the health cost experience of the overall community, not of special groups such as young, healthy employees. In the HMO Amendments of 1981 (Public Law 97-35), Congress modified that requirement and allowed HMOs to become more competitive by setting their community rates by class. Classes subsequently permitted by the Secretary of Health and Human Services include age, sex, family size, and industry of the insured. Because smoking status is not one of these, each HMO must individually petition the Federal Government to use smoking as one of its classification factors. As of March 1988, only one had applied for permission and received it. The Contra Costa Health Plan in 1987 became the first federally qualified HMO to use smoking as a factor in calculating its group health premiums. To do so, it received approval by the Office of Prepaid Health Care, Department of Health and Human Services. Contra Costa based its request, and the Federal office its approval, on a study (Brink 1987) that reported that nonsmokers incurred 18.5 percent lower health care costs than smokers (Contra Costa Health Plan 1987).

In summary, as of 1987, approximately one in seven commercial health carriers and BC/BS plans offered nonsmoking discounts on individual policies; these discounts ranged from 3 to 15 percent. A few carriers have introduced discounts of 2 to 3 percent on group policies where certain percentages of the groups are nonsmokers. Only one federally qualified HMO offers a nonsmoker discount; it is approximately 5 percent of premium cost.

Factors Influencing Decisions About Premium Differentials

Several factors have contributed to the slower development of smoker–nonsmoker premium differentials by health and disability insurers compared with life insurers. First, there are fewer actuarial data to document that nonsmokers incur fewer health care costs. Second, most health insurance is purchased on a group basis, which makes calculating discounts more difficult and makes validation of smoking status nearly impossible because no individual examination is undertaken. Third, as discussed above, current Federal regulations for HMOs preclude the use of smoking status in calculating premiums.

Health insurers have offered nonsmoker discounts with little supportive actuarial experience that nonsmokers incur fewer claims. Many insurers have not developed such data because they have not had the ability to separate the claims experience of smokers from nonsmokers. In addition, smaller companies may not have the statistical resources to collect or analyze such data. In one recent survey, only 32 percent of commercial carriers with premium differentials and 70 percent of BC/BS plans had the ability to develop the appropriate actuarial data (NAIC 1987c).

The first major compilation of claims data was made in 1987 by NAIC (1987c). It supported smoker–nonsmoker premium differentials in most cases. Analysis of the claims experience of eight commercial carriers justified a nonsmoking discount of 28 percent on hospital–medical policies, whereas a similar analysis of five BC/BS plans justified a 19-percent discount (Table 17). Claims data from all five BC/BS plans justified nonsmoking discounts that were more than or equal to that offered. The experience was not so clearcut for commercial carriers. The data from one company, with more than half of the total claims experience, supported a larger discount. However, claims experience justified nonsmoker discounts for only three of the seven smaller companies. This inconsistency may be explained by the misclassification of smokers in the "nonsmoker" policyholder category. This is suggested by the fact that only 20 percent of all adjusted earned premiums were held by policyholders classified as smokers, a much lower percentage than the prevalence of smoking in the general population. This discrepancy may result from smokers misrepresenting their status,

TABLE 17.—Summary of smoker–nonsmoker health and disability claims experience

	Adjusted earned premiums ($)		Loss ratio[a]	
	Nonsmoker	Smoker	Nonsmoker	Smoker
Hospital/medical insurance				
Commercial carrier	120,694,007	29,857,057	49.1	68.7
Blue Cross–Blue Shield	55,791,022	32,449,964	71.6	88.2
Disability insurance				
Commercial carrier				
Nonsmoker discount	11,445,976	3,931,357	30.4	25.1
Smoker surcharge	50,404,495	5,182,015	31.3	61.1
Blue Cross–Blue Shield	26,226,456	10,822,819	76.9	104.8

[a]Ratio of claims incurred to earned premiums, multiplied by 100. A loss ratio of 100 indicates that claims incurred equal earned premiums.
SOURCE: NAIC (1987c).

from excessively lenient eligibility standards for nonsmoker status, or from certain plans having an excess number of older former smokers who had quit smoking because of smoking-related illness.

For disability insurance policies, a nonsmoking discount of 25 percent was justified by the analysis of seven commercial carriers and one BC/BS plan (Table 17). However, as with hospital–medical policies, the claims experience of a single large insurer overwhelmed those of the others. Only one of the other carriers had experience that justified a discount. On the other hand, analysis of claims data from the five commercial carriers that charged smokers a premium surcharge rather than offering nonsmokers a discount supports these increased rates for smokers.

Another reason health insurers have been reluctant to offer nonsmoking discounts is that most insurance is purchased by groups. Premiums paid by groups are commonly "experience rated"; premiums paid in a given year are based largely on the overall costs of claims incurred by the group in the previous year or years. In theory, the experience rating mechanism should eventually result in lower premiums to groups with relatively more nonsmokers, if their health care costs are in fact lower than those of smokers. A group with fewer smokers should incur fewer health care costs, which should be reflected in their subsequent premiums. Adding a premium discount based on the proportion of nonsmokers in the group simply adds administrative problems with determining and validating the proportion of nonsmokers in the group. Finally, because the difference in health care costs between smokers and nonsmokers differs across various age groups, computation of discounts is complicated and must involve adjustment by the age mix of the employee group (Hellauer 1988).

Property and Casualty Insurance

There is a clear rationale for offering nonsmoker discounts on homeowner policies. Between 1981 and 1985, smoking materials caused 7.1 percent of all home fires, 8.0 percent of all home fire property damage, and 31.3 percent of all home fire civilian deaths (National Fire Protection Association 1987). In 1985 alone, smoking materials in the United States caused almost a quarter million home fires. Associated with those fires were 1,703 deaths, 3,997 injuries, and 422 million dollars in direct property damage (Hall 1987).

Smoker–nonsmoker premium differentials on auto insurance are based on studies demonstrating that nonsmokers have fewer motor vehicle accidents. Farmers' Insurance Group, the first property and casualty insurer to offer these discounts, instituted its nonsmoker discounts because of an early study reporting an association between smoking and vehicular accidents (Adams and Williams 1965, 1966). Farmers' own internal study of several thousand of its policyholders revealed that its nonsmokers had a lower accident rate and fewer claims than smokers. Subsequent claims experience has confirmed the original findings, as has nonindustry research (McGuire 1972; Grout et al. 1983; DiFranza et al. 1986).

The specific reason for the better safety record of nonsmokers is not clearly understood, and the relationship may not be causal. Several potential explanations for smokers' higher accident rate have been suggested: (1) smoking while driving may